

# IMMUNOLOGY

## A SYNTHESIS

Second Edition

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## PART-OPENING ELECTRON MICROGRAPHS

Part 1 (page 19): Antibody-hapten complex (purified rabbit anti-2,4-dinitrophenyl antibody and a bivalent hapten). [From Valentine and Green, 1967. *J. Mol. Biol.* 27: 615]

Part 2 (page 191): A resting lymphocyte, probably a T cell ( $\times 21,800$ ). [Courtesy of D. Zucker-Franklin, New York University Medical Center]

Part 3 (page 543): Immune complexes, seen as electron-dense, hump-shaped deposits in the upper third of the photo, along a capillary wall in a glomerulus following streptococcal glomerulonephritis ( $\times 17,250$ ). [Courtesy of M. N. Yum, Indiana University Medical Center]

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### Cross Reactivity

Antibody molecules can exhibit great specificity, but there are CROSS REACTIONS—cases in which antibody to antigen A also reacts with antigen B. This can be due to the presence of the same molecular configuration, or ANTIGENIC DETERMINANT, on the two antigens, or to properties of a determinant that allow it to be recognized as though it were another group. Antigenic determinants are also called *epitopes*. As we move through the book we will use these terms almost interchangeably. We can conceive of molecules that have similar but not identical structures and appear in closely related species. These molecules may have enough similarity to allow antibodies against one to react with the other.<sup>1</sup>

Table 5 shows the percentage of cross reactivity between albumins of different species. Antibody was made against bovine serum albumin (BSA), and the extent of the ability of albumins from other species to react with the anti-BSA was then determined. This cross reactivity is probably due to the presence of common determinants on the different albumins. To determine this, however, each of the determinants must be isolated and studied chemically. Even then, as we will see later in this chapter, we cannot be quite certain of

<sup>1</sup>The neurobiologist A. K. Hall has suggested the term IMMUNOFREQUENT for such determinants.

**Table 5** Cross reaction between BSA and other albumins.<sup>a</sup>

Albumin source	Percentage of cross reactivity with BSA	Albumin source	Percentage of cross reactivity with BSA
Human	15	Mouse	10
Pig	32	Rat	13
Sheep	75	Hamster	13
Horse	13	Cat	25
Guinea pig	5	Vallaroo	6
Dog	13		

Source: Data from Weigle, 1961. *J. Immunol.* 87: 599.

<sup>a</sup>Rabbit anti-BSA was absorbed with each of the albumins listed and then tested for its ability to react with BSA. This ability is expressed as a percentage *cross reactivity*. The data show that sheep BSA has the highest amount of cross reactivity and guinea pig and vallaroo the least.